

Perinatal Mortality in the St. Louis Metropolitan Area

THE DIFFICULTIES in obtaining meaningful statistics on perinatal and infant mortality for comparison on a large scale have been pointed out previously (1). Even on a State or local level, it is difficult to easily obtain satisfactory data for comparison.

For a comparison of recent perinatal and infant mortality rates in the St. Louis metropolitan area and the State of Missouri, statistical data were obtained from reports of the Center of Vital Statistics, State of Missouri, 1973; annual report of the Department of Community Health and Medical Care, St. Louis County, Mo.; reports of the Center of Vital Statistics, City of St. Louis, Mo.; and a review of recent vital statistics from St. Louis City Hospital 1 (SLCH), St. Louis City Hospital 2, St. Mary's Health Center (SMHC), and St. John's Mercy Health Center. (The St. Louis City Hospital and St. Mary's Health Center are members of the St. Louis University Group Hospitals.)

SLCH is a municipal institution with an indigent population. The obstetrical patients are treated by the resident staff under the supervision of attending physicians. Records of obstetrical patients are not kept by racial breakdown, but the estimated ratio is about 40 percent white and 60 percent nonwhite.

SMHC is a private, university-affiliated hospital; the majority of its patients are in the mid- or upper-socioeconomic classes. Again records are not kept by race, but it is estimated that the obstetrical population is about 95 percent white and 5 percent nonwhite.

The following definitions for various rates were used in this study:

Fetal mortality rate—the number of stillborn infants of 500 grams or more (equivalent to 20 weeks'

gestation if weight is not available) per 1,000 total births—live births plus stillbirths.

Neonatal mortality rate—the number of deaths of live born infants within the first 28 days of life divided by the number of live births (20 weeks' gestation or 500 grams) times 1,000.

Perinatal mortality rate—the sum of the fetal and neonatal mortality rates.

Not every source of data adhered exactly to these definitions, but wherever possible, figures were corrected for the differences in definition.

Results and Discussion

Table 1 presents the vital statistics of infants for the St. Louis metropolitan area and for the State of Missouri for 1973.

The breakdown of neonatal deaths by birth weight at SLCH and SMHC, detailed in table 2, shows a direct comparison of the neonatal mortality between the two hospitals for the years 1972-74. The prematurity rate (infants less than 2,500 grams at birth) at SLCH is about three times that of SMHC (12.7 at SLCH in contrast to 4.8 at SMHC). This difference is reflected in the overall higher neonatal mortality rate at SLCH and an increase in the number of neonatal deaths at SLCH in each category. When each weight category is compared, there is little difference in rates per category. However, the total number of births and deaths in each category is greater at SLCH than SMHC and therefore causes a greater overall neonatal mortality rate at SLCH.

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A comparison of the causes of both fetal and neonatal deaths at SLCH and SMHC from 1972 through 1974 is detailed in table 3. The diagnoses were obtained from charts of stillborn and neonatal deaths at each institution.

Charts were available for 39 of 82 fetal deaths at

SLCH and 27 of 45 fetal deaths at SMHC. The leading cause of fetal death seems to be related to abruptio placentae. The high rate of fetal deaths from erythroblastosis at SMHC reflects the interest of one physician in Rh disease and the large number of sensitized patients that he manages.

Table 1. Vital statistics of infants, St. Louis Metropolitan area and State of Missouri, 1973, and percentage by race, 1972 and 1973

Locale	Population	Live births	Percent less than 2,500 grams	Fetal deaths		Neonatal deaths		Perinatal rate	Infant deaths	
				Number	Rate	Number	Rate		Number	Rate
St. Louis City Hospital ¹ (SLCH)		1,671	11.8	25	17.3	28	16.8	31.7	...	...
St. Louis City Hospital ²		1,543	13.4	24	15.6	25	16.2	31.8	...	...
St. Mary's Health Center (SMHC)		1,937	4.7	19	9.8	19	9.8	19.6	...	...
St. John's Mercy Hospital Center		4,274	...	133	7.7	131	7.3	15.0	...	...
St. Louis City	578,218	² 9,147	10.9	144	15.7	174	19.0	34.8	251	27.4
Percent white	54.2	37.9	7.7	42	12.1	54	15.6	27.4	66	19.1
Percent nonwhite	45.8	62.1	12.8	102	17.9	120	21.0	38.4	185	32.6
St. Louis County	966,838	² 12,158	6.2	115	9.5	124	10.2	19.5	169	13.9
Percent white	94.8	86.4	5.5	86	8.1	105	9.9	18.0	146	13.7
Percent nonwhite	5.2	13.6	11.5	27	17.1	19	12.5	29.6	22	14.1
City and county	1,545,056	² 21,304	8.3	259	12.2	298	14.0	25.8	420	19.7
Percent white	80.8	46.2	6.1	128	9.1	159	11.3	20.1	212	15.0
Percent nonwhite	19.2	33.8	12.6	131	18.2	139	19.3	36.8	208	28.9
Missouri (1972)	4,755,000	² 75,127	9.6	880	12.1	984	13.5	25.4	1,329	19.3
Percent white		...	...	...	9.4	...	...	...	...	16.2
Percent nonwhite		...	...	...	18.2	...	...	...	...	28.5
Missouri (1973)	4,757,000	² 70,808	7.3	812	11.8	877	12.8	24.6	1,218	17.8
Percent white		80.7	6.2	...	10.6	...	11.8	22.4	...	15.9
Percent nonwhite		19.2	12.8	...	17.8	...	17.8	35.6	...	27.1

¹ No definition given.

² Resident events.

Charts were available for 66 of 96 neonatal deaths at SLCH and 30 of 44 neonatal deaths at SMHC. Respiratory distress syndrome (RDS) and other factors related to immaturity make up the vast bulk of the causes of neonatal death.

In the past 5 to 10 years remarkable advances have been made in the evaluation and care of the newborn, especially of low birth weight infants (3-5). As reflected in table 4, survival of even very low birth weight infants has improved remarkably.

Table 2. Neonatal deaths by birth weight (grams), St. Mary's Hospital Center (SMHC) and St. Louis City Hospital (SLCH), 1972-74

Item	Grams											
	Total		501-1,000		1,001-1,500		1,501-2,500		Total less than 2,500		Total greater than 2,500	
	SMHC	SLCH	SMHC	SLCH	SMHC	SLCH	SMHC	SLCH	SMHC	SLCH	SMHC	SLCH
1972												
Live births	2,119	1,814	8	9	9	21	102	165	119	195	2,000	1,619
Neonatal deaths ..	13	30	7	9	2	5	2	8	11	22	2	7
Rate ¹	6.1	16.5	875	1,000	222	238	19.6	48.0	92.4	113	1.0	4.3
1973												
Live births	1,937	1,671	5	24	12	22	75	151	92	197	1,845	1,474
Neonatal deaths ..	19	28	4	11	4	4	4	9	12	24	7	4
Rate ¹	9.8	16.8	800	458	334	182	53.3	59.6	130	122	3.8	2.7
1974												
Live births	1,873	1,429	8	15	7	34	58	184	73	233	1,800	1,196
Neonatal deaths ..	12	38	5	13	1	13	2	8	8	34	4	4
Rate ¹	6.4	26.6	625	865	143	383	34.5	43.5	186	146	2.2	3.3
Total												
Live births	5,928	4,714	21	48	28	77	236	500	284	625	5,645	4,289
Neonatal deaths ..	44	96	16	33	7	22	8	25	31	80	13	15
Rate ¹	7.4	19.5	762	688	250	273	33.9	50	109	128	2.3	3.5

¹ Per 1,000 live births in each weight category.

Table 3. Number and percent of fetal and neonatal deaths at St. Louis City Hospital (SLCH) and St. Mary's Hospital Center (SMHC), by cause, 1972-74

Causes	Fetal deaths						Neonatal deaths					
	SMHC		SLCH		Combined		SMHC		SLCH		Combined	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Congenital abnormalities ...	2	7	5	13	7	11	6	20	13	20	19	20
Respiratory distress syndrome	0	0	0	0	0	0	14	47	25	38	39	41
Immaturity	5	19	8	21	13	20	7	23	18	37	25	26
Erythroblastosis	5	19	0	0	5	8	0	0	1	1.5	1	1
Abruption	6	22	12	31	18	27	1	3.3	0	9	1	1
Placenta previa	2	7	0	0	2	3	1	3.3	1	1.5	2	2.1
Intracranial hemorrhage	1	4	3	8	4	6	0	0	2	3	2	2.1
Anoxia	2	7	7	18	9	14	1	3.3	2	3	3	3.4
Infection	1	4	0	0	1	2	0	0	2	3	2	2.1
Cord problems	3	11	4	10	7	11	0	0	2	3	2	2.1
Total ¹	27	..	39	..	66	..	30	..	66	..	96	..

¹ Total causes of deaths used in study.

Figures from the State of Missouri and the metropolitan St. Louis area (table 5) compare favorably with the national figures for 1973, even though the metropolitan area has a higher prematurity rate.

Mortality statistics, of course, are only a gross estimation of the quality of care given to the newborn. Morbidity data, however, have been difficult to obtain. In the past, the outlook for extremely low birth weight infants, in terms of neurological-intellectual sequelae, was considered poor. Recent studies by Davis and Steward (2) and Steward and Reynolds (5) have shown that even very low birth weight infants who receive intensive neonatal care can have an excellent prognosis. Comparisons of intellectual and neurological testing on low birth weight infants and infants of normal birth weight showed few differences.

Modern perinatal intensive care, therefore, has improved both the survivability and the outlook for low birthweight infants and has enabled the obstetrician to be more aggressive in the management of high-risk pregnancies.

Summary

Statistical data in fetal, neonatal, perinatal, and infant mortality were collected from various sources for the St. Louis metropolitan area (St. Louis City and St. Louis County). The overall perinatal mortality rate of 25.8 for the St. Louis metropolitan area in 1973 compares favorably with the national rate of 25.5 in 1973.

Table 4. Survival of infants, based on weight (grams), St. Louis City Hospital (SLCH), St. Mary's Health Center, 1972-74, California, 1969-70, and University of Alabama, 1974, by percentage

Weight (grams)	SLCH (1972-74)	SMHC (1972-74)	Combined (1972-74)	California	U. of
				(6) (1969-70)	Alabama (3) (1974)
501-1,000	31	24	28	8	21
1,001-1,500	73	75	74	56.5	63
1,501-2,500	95	96	95.5	95.4	..
Total less than than 2,500	87	89	88	87.7	..
Total greater than 2,500	99.6	99.8	99.7	99.7	..

¹ San Francisco area, prematurity rate 7.6.

Table 5. Comparison of rates for prematurity and mortality, St. Louis Metropolitan area, Missouri, and United States, 1973

Rates for—	St. Louis Metropolitan area	Missouri	United States ¹
Prematurity	8.3	7.3	7.5
Mortality:			
Fetal	12.2	11.8	12.3
Neonatal	14.0	12.8	12.7
Perinatal	25.8	24.6	25.5
Infant	19.7	17.8	17.6

¹ Source: Monthly vital statistics reports of the U.S. National Center for Health Statistics.

The prematurity rate at St. Louis City Hospital (SLCH) is almost three times that of St. Mary's Health Center (SMHC), 12.7 in contrast to 4.8. Both the neonatal and perinatal mortality rates at SLCH are about twice the rate of SMHC, neonatal 19.5 versus 7.4 and perinatal 31.7 in contrast to 19.6. Prematurity and its complications still seem to be the leading cause of neonatal mortality.

With modern obstetrical and intensive neonatal care, the survival rates for low birth weight infants has improved markedly. The combined survival rates at SLCH and SMHC, 1972 through 1974 for infants weighing 501-1,000 gms, 28 percent; 1,001-1,500 gms, 74 percent; 1,501-2,500 gms, 95.5 percent; and greater than 2,500 gms, 99.7 percent.

Recent studies have shown that the long-term prognosis for these low birth weight infants, in terms of neurological or intellectual sequelae is good. Thus, a more aggressive approach to the management of perinatal problems can be expected to yield excellent results.

References

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